CLAIMS

What is claimed is:

1. A protector for use in a battery comprising:

a positive temperature coefficient element (PTC) having an input terminal and an output terminal and which has an increased resistance as a temperature of the PTC rises so as to interrupt a current passing between the input and output terminals;

a first lead made of aluminum or an aluminum alloy and which is connected to the input terminal and connectable to a terminal of the battery; and

a second lead made of nickel or a nickel alloy and which is connected to the output terminal and connectable to another terminal of the battery.

2. A protector for use in a battery comprising:

a positive temperature coefficient element (PTC) having an input terminal and an output terminal and which has an increased resistance as a temperature of the PTC rises so as to interrupt a current passing between the input and output terminals;

a first lead connected to the input terminal and connectable to a terminal of the battery, the first lead comprising a first layer comprising nickel or a nickel alloy and which contacts the PTC, and a second layer on the first layer and comprising aluminum or an aluminum alloy; and

a second lead connected to the output terminal and connectable to another terminal of the battery, the second lead comprising nickel or a nickel alloy.

3. A lithium secondary battery comprising:

a can in which an electrode unit having positive and negative electrode plates with a separator interposed therebetween is housed with an electrolytic solution, the can comprising a conductive metal and having an upper opening that is sealed by a cap assembly having a first terminal electrically connected to one of the positive and negative electrode plates, and an outer bottom surface having a second terminal electrically connected to the other one of the positive and negative electrode plates;

a positive temperature coefficient (PTC) having an increased resistance when a temperature of the PTS rises so as to interrupt a current passing therethrough;

a first lead comprising aluminum or an aluminum alloy and which electrically connects the second terminal at the outer bottom surface with the PTC; and

a second lead comprising nickel or a nickel alloy and which electrically connects the PTC with a protecting circuit attached to the first terminal or the first terminal.

4. The lithium secondary battery of claim 3, wherein the conductive metal of the can comprises aluminum or an aluminum alloy.

5. The lithium secondary battery of claim 3, further comprising a safety vent for exhausting internal gas when pressure inside the can increases past a predetermined level and which is provided at one of an upper portion of the can and the cap assembly.

6. A lithium secondary battery comprising:

a can in which an electrode unit having positive and negative electrode plates with a separator interposed therebetween is housed with an electrolytic solution, the can comprising a conductive metal, an upper opening that is sealed by a cap assembly having a first terminal electrically connected to one of the positive and negative electrode plates, and an outer bottom surface having a second terminal electrically connected to the other one of the positive and negative electrode plates;

a positive temperature coefficient element (PTC) having an increased resistance as a temperature of the PTC rises so as to interrupt a current passing therethrough;

a first lead having a nickel layer made of nickel or a nickel alloy and a clad layer formed on a bottom surface of the nickel layer, the first lead electrically connecting the second terminal of the outer bottom surface of the can with the PTC; and

a second lead made of nickel or a nickel alloy and which electrically connects the PTC with a protecting circuit attached to the first terminal or the first terminal.

7. The lithium secondary battery of claim 6, wherein the conductive metal of the can is comprises aluminum or an aluminum alloy.

8. The lithium secondary battery of claim 6, further comprising a safety vent for exhausting internal gas when pressure inside the can increases past a predetermined level and which, is provided at one of an upper portion of the can and the cap assembly.

9. A lithium secondary battery comprising:

a can in which an electrode unit having positive and negative electrode plates with a separator interposed therebetween is housed with an electrolytic solution, the can comprising a conductive metal, an upper opening that is sealed by a cap assembly having a first terminal electrically connected to one of the positive and negative electrode plates, and an outer bottom surface having a second terminal electrically connected to the other one of the positive and negative electrode plates;

a positive temperature coefficient element (PTC) having an increased resistance as a temperature of the PTC rises so as to interrupt a current passing therethrough;

an input lead connected to the PTC and comprising nickel or a nickel alloy;

a first lead having a nickel layer made of nickel or a nickel alloy, and a clad layer made of aluminum or an aluminum alloy on a bottom surface of the nickel layer, the first lead electrically connecting the second terminal of the outer bottom surface of the can with the input lead; and

a second lead made of nickel or a nickel alloy and electrically connecting the PTC with a protecting circuit attached to the first terminal or the first terminal.

10. The lithium secondary battery of claim 9, wherein the conductive material of the can comprises aluminum or an aluminum alloy.

11. The lithium secondary battery of claim 9, further comprising a safety vent for exhausting internal gas when pressure inside the can increases past a predetermined level and, is provided at one of an upper portion of the can and the cap assembly.

12. A lithium battery comprising:

a generation element which generates electrical power;

a can which houses the generation element and which has a first surface and a second surface, the first surface comprising a first terminal electrically connected to the generation element and the second surface comprising a second terminal electrically connected to the generation element; and

a lead unit which electrically connects the first terminal and the second terminal through a safety device and having a lead plate with one end disposed at the first surface and another end disposed at the safety device.

13. The lithium battery of claim 12, wherein the can comprises a first material and the lead plate comprises the first material.

14. The lithium battery of claim 13, wherein the lead unit further comprises another lead plate electrically connecting the safety device and the second terminal, the another lead plate comprising a second material other than the first material.

15. The lithium battery of claim 12, further comprising a safety vent which exhausts internal gas when pressure inside the can increases past a predetermined level, the safety vent being at the second surface of the can.

16. The lithium battery of claim 15, wherein:

the can further comprises an opening through which the generation element is introduced into the can, and a cap which closes the opening, and

the safety vent is disposed on the cap.

17. The lithium battery of claim 12, wherein the safety device interrupts current flowing therethrough when a voltage of the battery sharply increases.

18. The lithium battery of claim 17, further comprising a protecting circuit which prevents overcharging and over discharging and which is electrically connected by the lead unit between the safety device and the second terminal.

19. The lithium battery of claim 18, wherein the lead unit further comprises another lead plate that electrically connects the safety device and the protecting circuit and which comprises the second material.

20. The lithium battery of claim 19, wherein the lead unit further comprises a third lead plate electrically connecting the protecting circuit and the second terminal.

21. The lithium battery of claim 13, wherein the can comprises a first material, the one end of the lead plate comprises the first material, and the other end of the lead plate comprises a second material other than the first material.

22. The lithium battery of claim 21, wherein the one end of the lead plate further comprises a first layer comprising the second material, and a second layer of the first material disposed between the first layer and the first surface of the can.

23. The lithium battery of claim 22, wherein the second layer contacts the first terminal.

24. The lithium battery of claim 22, wherein the other end of the lead plate comprises the first layer of the second material and the first layer contacts the safety device.

25. The lithium battery of claim 22, wherein the lead unit further comprises an input lead of the second material and which connects the safety device and the other end of the lead plate.

26. The lithium battery of claim 24, wherein the safety device interrupts current flowing therethrough when a voltage of the battery sharply increases.

27. The lithium battery of claim 12, wherein the lead plate is attached to the first surface using ultrasonic welding.

28. The lithium battery of claim 12, wherein the lead plate is attached to the first surface using resistance welding.

29. A protector for use in a battery comprising:

a safety device which interrupts current passing through the safety device when a voltage of the battery sharply increases;

a first lead which is connected to the safety device and which comprises a first material at an end of the first lead that is connectable to a terminal of the battery comprising the first material; and

a second lead which is connected to the safety device and is connectable to another terminal of the battery.

30. The protector of claim 29, wherein the second lead comprises a second material other than the first material.

31. The protector of claim 29, wherein the first lead comprises a first layer comprising a second material other than the first material and which contacts the safety device, and a second layer comprising the first material disposed so as to contact the another terminal of the battery at the end of the first lead.

32. The protector of claim 29, further comprising an input lead of a second material other than the first material and which connects the safety device and the first lead.